

CLAIMS

1. A fuel cell pack (2; 102, 102', 102'') intended to be integrated into a power-producing device, this cell
5 pack comprising a plurality of elementary cells (32) and fluid distribution means which make it possible to supply each cell with two input fluids and also to discharge two output fluids from these cells, these
10 fluid distribution means being able to be connected to a fluid distribution system (6, 8, 14, 16, 18, 20, 22; 106) belonging to said power-producing device, characterized in that the distribution means comprise, on one side of the cell pack, a series of first valve
15 elements (30₁-30₄; 130₁, 130₂, 130'₁, 130'₂, 130''₁, 130''₂) which are able, in the assembled configuration, to cooperate with a series of second valve elements (24₁-24₄; 124₁, 124₂, 124'₁, 124'₂, 124''₁, 124''₂) borne by the fluid distribution system.
- 20 2. The fuel cell pack as claimed in claim 1, characterized in that the first valve elements (30₁-30₄; 130₁, 130₂, 130'₁, 130'₂, 130''₁, 130''₂) are arranged on the same face of the cell pack (2; 102, 102', 102'').
- 25 3. The fuel cell pack as claimed in claim 2, characterized in that the valve elements have main directions (axis A) which are parallel to one another.
- 30 4. The fuel cell pack as claimed in claim 3, characterized in that each valve element (30₁-30₄) comprises an opening/closing member (62, 64) which can move in said main direction (A).
- 35 5. The fuel cell pack as claimed in claim 4, characterized in that each valve element (30₁-30₄) comprises a hollow body (54), inside which is housed the moving member (62, 64), and also a spring (66)

which is able to return this moving member into its closed position.

6. The fuel cell pack as claimed in one of claims 2 to 5, characterized in that the first valve elements (30₁-30₄) are arranged on an end plate (26) of the cell pack, additionally providing a mechanical retaining function.
7. A power-producing device based on a fuel cell, comprising at least one cell pack (2; 102, 102', 102'') and also a fluid distribution system (6, 8, 14, 16, 18, 20, 22; 106) which is able to supply the or each cell pack which two input fluids and also to discharge at least two output fluids coming from this cell pack, this distribution system being able to be connected to external circuits for supplying the input fluids and also for discharging the output fluids, characterized in that the or each cell pack is as set out in one of the preceding claims, and in that the power-producing device also comprises second valve elements (24₁-24₄; 124₁, 124₂, 124'₁, 124'₂, 124''₁, 124''₂), each second valve element being able to cooperate with a corresponding first valve element (30₁-30₄; 130₁, 130₂, 130'₁, 130'₂, 130''₁, 130''₂) with which the cell pack is provided.
8. The power-producing device as claimed in claim 7, characterized in that the fluid distribution system comprises a support member (6; 106), in particular a plate, on which are mounted various members (8, 14, 16, 18, 20) for distributing the input and output fluids.
9. The power-producing device as claimed in claim 8, characterized in that the support member (6; 106) is made of a plastic by injection molding or compression molding.

10. The power-producing device as claimed in claim 8 or 9, characterized in that the support member (6; 106) has integrated channels cut into it which allow the various fluids to circulate.

5 11. The power-producing device as claimed in one of claims 8 to 10, characterized in that it comprises a number of cell packs (102, 102', 102''), each of which is provided with a series of first valve elements
10 (130₁, 130₂, 130'₁, 130'₂, 130''₁, 130''₂), whereas the fluid distribution system is provided with a number of series of second valve elements (124₁, 124₂, 124'₁, 124'₂, 124''₁, 124''₂), each series of second valve elements being able to cooperate with a corresponding
15 series of first valve elements.

12. The power-producing device as claimed in one of claims 7 to 11, characterized in that each second valve element (24₁-24₄) is provided with an actuating element
20 (42, 44) which is able to move the moving member (62, 64) of each first valve element from its closed position to its open position.

13. The power-producing device as claimed in claim 12,
25 characterized in that the actuating member (42, 44) of each second valve element (24₁-24₄) is an opening/closing member which can move in a main direction of said second valve element.

30 14. The power-producing device as claimed in claim 13, characterized in that each second valve element (24₁-24₄) comprises a hollow body (34), inside which is housed the moving member (42, 44), and also a spring (46) which is able to return this moving member into
35 its closed position.

15. The power-producing device as claimed in claim 14, characterized in that a free end of the hollow body

(34) of one (24₁) of the first or second valve elements is able to be fitted, with interposition of a sealing element (35), into the hollow body (54) of the other (30₁) of the first and second valve elements.

- 5 16. The power-producing device as claimed in any one of claims 7 to 15, characterized in that a major part of the various valve elements (24₁-24₄, 30₁-30₄; 124₁, 124₂, 124'₁, 124'₂, 124''₁, 124''₂, 130₁, 130₂, 130'₁;
10 130'₂, 130'₁, 130''₂) is made of a plastic by injection molding or compression molding.